

### **Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

Claim 1 (currently amended): A method of detecting a target nucleic acid or protein, comprising:

- (a) providing a target comprising a target nucleic acid or protein and a first member of a binding pair;
- (b) hybridizing the target nucleic acid or protein to a probe attached to a hydrogel matrix through a 2 + 2 photocycloaddition;
- (c) contacting the first member of the binding pair with a second member of the binding pair, said second member comprising a fluorophore; and
- (d) detecting the fluorophore additions, thereby detecting said target nucleic acid or protein.

Claim 2 (original): The method of claim 1, wherein the first member comprises a first member selected from the group consisting of biotin, digoxigenin, and bromouridine.

Claim 3 (original): The method of claim 2, wherein the first member comprises biotin.

Claim 4 (original): The method of claim 1, wherein the second member is selected from the group consisting of avidin, streptavidin, biotin antibody, digoxigenin antibody, and bromouridine antibody.

Claim 5 (original): The method of claim 4, wherein the second member comprises streptavidin.

Claim 6 (original): The method of claim 1, wherein the nucleic acid is synthesized by producing a cDNA from a mRNA.

Claim 7 (original): The method of claim 1, wherein the nucleic acid is synthesized by producing a cDNA or a cRNA from a DNA.

Claim 8 (original): The method of claim 1, wherein the target is synthesized by incorporating the first member of a binding pair into the nucleic acid by polymerization.

Claim 9 (original): The method of claim 1, wherein the protein is from a cell lysate.

Claim 10 (original): The method of claim 1, wherein the hydrogel matrix comprises polyacrylamide.

Claim 11 (original): The method of claim 1, wherein the hydrogel matrix comprises polyurethane.

Claim 12 (original): The method of claim 1, wherein the probe comprises a reactive site capable of undergoing a 2 + 2 photocycloaddition.

Claim 13 (original): The method of claim 1, wherein the hydrogel matrix comprises a reactive site capable of undergoing a 2 + 2 photocycloaddition.

Claim 14 (original): The method of claim 5, wherein the streptavidin is attached to one or more fluorophores.

Claim 15 (original): The method of claim 14, wherein the streptavidin is attached to between three and four fluorophores.

Claim 16 (original): The method of claim 1, wherein said fluorophore is selected from the group consisting of cyanine dyes and ALEXA FLUOR dyes.

Claim 17 (original): The method of claim 16, wherein the cyanine dye is Cy-3, Cy-5, or Cy-5.5.

Claim 18 (original): The method of claim 16, wherein the ALEXA FLUOR dye is ALEXA-532, ALEXA-647, or ALEXA-633.

Claim 19 (original): The method of claim 1, wherein said fluorophore is ALEXA-647.

Claim 20 (original): The method of claim 1, further comprising contacting at least one of the second members of the binding pair with an antibody comprising a first member.

Claim 21 (original): The method of claim 20, wherein the antibody is a biotinylated anti-streptavidin antibody.

Claim 22 (original): The method of claim 20, wherein the first member comprises biotin and the second member comprises streptavidin attached to more than one fluorophore.

Claim 23 (withdrawn): A kit for detecting a target nucleic acid or protein, comprising:

- (a) a hydrogel matrix;
- (b) a probe capable of hybridizing a target, wherein said probe is attached to said hydrogel matrix by a 2 + 2 photocycloaddition;
- (c) a first member of a binding pair capable of being attached to a nucleic acid or protein to form a target; and

- (d) a second member of the binding pair capable of binding the first member of the binding pair; said second member comprising a fluorophore.

Claim 24 (withdrawn): The kit of claim 23, further comprising probe standards and target standards.

Claim 25 (withdrawn): The kit of claim 23, wherein the first member is selected from the group consisting of biotin, digoxigenin, and bromouridine.

Claim 26 (withdrawn): The kit of claim 23, wherein the first member comprises biotin.

Claim 27 (withdrawn): The kit of claim 23, wherein the second member is selected from the group consisting of avidin, streptavidin, biotin antibody, digoxigenin antibody, and bromouridine antibody.

Claim 28 (withdrawn): The kit of claim 27, wherein the second member comprises streptavidin.

Claim 29 (withdrawn): The kit of claim 23, wherein the hydrogel matrix comprises polyacrylamide.

Claim 30 (withdrawn): The kit of claim 23, wherein the hydrogel matrix comprises polyurethane.

Claim 31 (withdrawn): The kit of claim 23, wherein the probe comprises a reactive site capable of undergoing a  $2 + 2$  photocycloaddition.

Claim 32 (withdrawn): The kit of claim 23, wherein the hydrogel matrix comprises a reactive site capable of undergoing a  $2 + 2$  photocycloaddition.

Claim 33 (withdrawn): The kit of claim 23, wherein the nucleic acid comprises a cDNA or a cRNA.

Claim 34 (withdrawn): The kit of claim 23, wherein the protein is from a cell lysate.

Claim 35 (withdrawn): The kit of claim 28, wherein the streptavidin is attached to more than one fluorophore.

Claim 36 (withdrawn): The kit of claim 35, wherein the streptavidin is attached to between three and four fluorophores.

Claim 37 (withdrawn): The kit of claim 23, wherein the fluorophore is Cy-3, Cy-5, or Cy-5.5.

Claim 38 (withdrawn): The kit of claim 23, wherein the fluorophore is ALEXA-532, ALEXA-647, or ALEXA-633.

Claim 39 (withdrawn): The kit of claim 23, wherein the fluorophore is ALEXA-647.

Claim 40 (withdrawn): The kit of claim 23, further comprising an antibody that binds to the second member of the binding pair.

Claim 41 (withdrawn): The kit of claim 40, wherein the antibody comprises a first member of the binding pair.

Claim 42 (withdrawn): The kit of claim 41, wherein the antibody comprises a biotinylated anti-streptavidin antibody.

Claim 43 (currently amended): A method of detecting a single nucleotide polymorphism, comprising:

- (a) hybridizing a target nucleic acid to a probe attached to a hydrogel matrix through a 2 + 2 photocycloaddition, said probe designed to terminate at the site of the single nucleotide polymorphism;
- (b) extending the probe by one nucleotide, wherein the nucleotide comprises a first member of a binding pair;
- (c) contacting the first member of the binding pair with a second member of the binding pair comprising a fluorophore; and
- (d) detecting the fluorophore additions, thereby detecting the single nucleotide polymorphism.

Claim 44 (original): The method of claim 43, wherein the nucleotide is a dideoxynucleotide or an acyclonucleotide.

Claim 45 (original): The method of claim 43, wherein the nucleotide comprises the first member of the binding pair before said nucleotide is incorporated into the probe.

Claim 46 (original): The method of claim 43, wherein the first member of the binding pair is attached to the nucleotide after incorporation of the nucleotide into the probe.

Claim 47 (original): The method of claim 43, wherein the first member of the binding pair comprises biotin.



Claim 48 (original): The method of claim 46, wherein the second member of the binding pair comprises streptavidin.

Claim 49 (original): The method of claim 43, wherein the hydrogel matrix comprises polyacrylamide or polyurethane.

Claim 50 (original): The method of claim 1, wherein the probe comprises a reactive site capable of undergoing a 2 + 2 photocycloaddition.

Claim 51 (original): The method of claim 48, wherein the streptavidin is attached to more than one fluorophore.

Claim 52 (original): The method of claim 43, wherein said fluorophore is selected from the group consisting of cyanine dyes and ALEXA FLUOR dyes.

Claim 53 (original): The method of claim 52, wherein the cyanine dye is Cy-3, Cy-5, or Cy-5.5.

Claim 54 (original): The method of claim 52, wherein the ALEXA FLUOR dye is ALEXA-532, ALEXA-647, or ALEXA-633.

Claim 55 (original): The method of claim 43, wherein said fluorophore is ALEXA-647.

Claim 56 (original): The method of claim 43, further comprising contacting at least one of the second members of the binding pair with an antibody comprising a first member.

Claim 57 (original): The method of claim 56, wherein the antibody is a biotinylated anti-streptavidin antibody.

Claim 58 (original): The method of claim 56, wherein the first member comprises biotin and the second member comprises streptavidin attached to more than one fluorophore.

Claim 59 (withdrawn): A kit for detecting a single nucleotide polymorphism, comprising:

- (a) a probe attached to a hydrogel matrix through a 2 + 2 photocycloaddition, wherein said probe is designed to terminate at the site of a single nucleotide polymorphism;
- (b) a nucleotide comprising a first member of a binding pair, wherein said nucleotide is designed to extend the probe by one nucleotide;
- (c) a second member of the binding pair comprising a fluorophore, wherein said second member binds to the first member.

Claim 60 (withdrawn): The kit of claim 59, wherein the nucleotide is a dideoxynucleotide or an acyclonucleotide.

Claim 61 (withdrawn): The kit of claim 59, wherein the nucleotide comprises the first member of the binding pair before said nucleotide is incorporated into the probe.

Claim 62 (withdrawn): The kit of claim 59, wherein the first member of the binding pair is attached to the nucleotide after incorporation of the nucleotide into the probe.

Claim 63 (withdrawn): The kit of claim 59, wherein the first member of the binding pair comprises biotin.

Claim 64 (withdrawn): The kit of claim 59, wherein the second member of the binding pair comprises streptavidin attached to more than one fluorophore.

Claim 65 (withdrawn): The kit of claim 59, wherein the hydrogel matrix comprises polyacrylamide or polyurethane.

Claim 66 (withdrawn): The kit of claim 59, wherein the fluorophore is selected from the group comprising ALEXA FLUOR and cyanine dyes.

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Claim 67 (withdrawn): The kit of claim 59, wherein said fluorophore is ALEXA-647.